

## ***REMARKS***

This is a full and timely response to the outstanding final Office Action mailed on May 1, 2003. Reconsideration and allowance of the application and presently pending claims 1-30 are respectfully requested.

### **Present Status of the Patent Application**

Claims 1-30 remain pending in the present application. Claims 1-30 have been rejected. Claims 3, 11, 16, and 27-30 have been amended.

### **Response To Claim Objections**

Claims 28-30 have been objected to due to the use of the term “method” in the preamble. The Applicant has amended claims 28-30 to replace the term “method” with the term “system”, as suggested by the Examiner, to overcome this objection.

Applicant wishes to clarify that the foregoing amendments have been made for purposes of better defining the invention in response to the objection, and not in response to the rejections made based on prior art. Indeed, Applicant submits that no substantive limitations have been added to the claims. Therefore, no prosecution history estoppel arises from this/these amendment/amendments. Black & Decker, Inc. v. Hoover Service Center, 886 F.2d 1285, 1294 n. 13 (Fed. Cir. 1989); Andrew Corp. v. Gabriel Electronics, Inc., 847 F.2d 819 (Fed. Cir. 1988); Hi-Life Products Inc. v. American National Water-Mattress Corp., 842 F.2d 323, 325 (Fed. Cir. 1988); Mannesmann Demag Corp. v. Engineered Metal Products Co., Inc., 793 F.2d 1279, 1284-1285 (Fed. Cir. 1986); Moeller v. Ionetics, Inc., 794 F.2d 653 (Fed. Cir. 1986).

### **Response To Claim Rejections Under 35 U.S.C. §102**

Claims 3-13 and 19-30 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Aslanis et al. (U.S. Patent No. 5,627,863). Applicant respectfully traverses this rejection.

For a proper rejection of a claim under U.S.C. §102(b), the cited reference must disclose all elements/features/steps of the claim. See, e.g., E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 7 USPQ2d 1129 (Fed. Cir. 1988).

### *Independent Claim 3*

Independent claim 3, as amended, is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “detecting a phase error between a received pilot tone and a local oscillator signal.”

In this regard, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 50 in Fig. 1 and col. 6, lines 19-27:

The FEQ and decoder unit 36 [40] supplies the phase information of the received pilot tone via a line 54 to the phase comparator 50, and a stored reference phase is also supplied to the phase comparator 50 from a store 56. The phase comparator 50 produces at its output a digital phase error control signal which is filtered by digital and analog filters in the unit 52 to produce an analog control voltage; this is used to control VCXO 46 to maintain frequency synchronization.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “detecting a phase error between a received pilot tone and a local oscillator signal.” Aslanis merely discloses detecting a phase error between “the phase information of the received pilot tone” and “a stored reference phase.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 3, and the rejection of claim 3 should be withdrawn.

### *Independent Claim 7*

Independent claim 7 is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “zeroing out the received digital signal stream from the input to a phase locked-loop while the cyclic prefix is present in the received signal stream to create a frequency correction signal.”

In this regard, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 36 in Fig. 1 and col. 5, lines 23-27, which specifically states:

The equalized serial time domain sample stream is supplied to the buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol, the 32 bits of the cyclic prefix thereby being removed.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “zeroing out the received digital signal stream from the input to a phase locked-loop while the cyclic prefix is present in the received signal stream to create a frequency correction signal.” Aslanis merely discloses removing the cyclic prefix by “buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 7, and the rejection of claim 7 should be withdrawn.

*Independent Claim 9*

Independent claim 9 is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “removing the cyclic prefix portion of the equalized digital signal stream from the input to a phase locked-loop to create a frequency correction signal.”

In this regard, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 36 in Fig. 1 and col. 5, lines 23-27, which specifically states:

The equalized serial time domain sample stream is supplied to the buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol, the 32 bits of the cyclic prefix thereby being removed.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “removing the cyclic prefix portion of the equalized digital signal stream from the input to a phase locked-loop to create a frequency correction signal.” Aslanis merely discloses removing the cyclic prefix by “buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 9, and the rejection of claim 9 should be withdrawn.

### *Independent Claim 11*

The amendment in claim 11 was made to better define the invention. However, no substantive changes have been made to the claim, and the amendment was not made for purposes of defining over the cited reference or otherwise for purposes of patentability. Nor has any new matter been introduced to the application by virtue of this amendment.

Independent claim 11, as amended, is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “using the digital signal stream with the cyclic prefix portion removed to estimate the phase error with a discrete Fourier transform (DFT).”

In this regard, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 38 in Fig. 1 and col. 5, lines 27-31, which specifically states:

These 512 time domain samples are supplied to the 512-point FFT unit 38 and are transferred by this unit to a frequency domain multicarrier symbol, comprising 256 complex tone amplitudes, which is supplied to the frequency domain equalizer (FEQ) in the unit 40.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “using the digital signal stream with the cyclic prefix portion removed to estimate the phase error with a discrete Fourier transform (DFT).” Aslanis merely discloses that “[t]hese 512 time domain samples are supplied to the 512-point FFT unit 38 and are transferred by this unit to a frequency domain multicarrier symbol, comprising 256 complex tone amplitudes.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 11, and the rejection of claim 11 should be withdrawn.

### *Independent Claim 13*

Independent claim 13 is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “[a] digital signal processor configured to apply the method of claim 1.”

The Office Action’s rejection of claim 13 appears to be improper, because it acknowledges the fact that “Jenness does not disclose the method of claim 1 configured into a DSP,” (Jenness is addressed not Aslanis) and the only reason given for the rejection is that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to

implement the steps of claim 1 into a DSP rather than the individual devices to perform each step because this would save cost and simplify implementation” (an improper §102 rejection). Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 13, and the rejection of claim 13 should be withdrawn.

#### *Independent Claim 19*

Independent claim 19 is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “a state machine in communication with the ADC configured to determine the phase offset on a pilot tone in a received signal segment.”

In this regard, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 50 in Fig. 1 and col. 6, lines 19-27, which specifically states:

The FEQ and decoder unit 36 [40] supplies the phase information of the received pilot tone via a line 54 to the phase comparator 50, and a stored reference phase is also supplied to the phase comparator 50 from a store 56. The phase comparator 50 produces at its output a digital phase error control signal which is filtered by digital and analog filters in the unit 52 to produce an analog control voltage; this is used to control the VCXO 46 to maintain frequency synchronization.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “ a state machine in communication with the ADC configured to determine the **phase offset** on a pilot tone in a received signal segment.” Aslanis merely discloses a phase comparator that “produces at its output a digital phase error control signal.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 19, and the rejection of claim 19 should be withdrawn.

#### *Independent Claim 21*

Independent claim 21 is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “a symbol synchronizer in communication with the ADC configured to determine when the data stream contains a cyclic prefix, the signal synchronizer further configured to remove the received signal from the phase locked-loop input when the cyclic prefix is present.”

In this regard, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 36 in Fig. 1 and col. 5, lines 23-27, which specifically states:

The equalized serial time domain sample stream is supplied to the buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol, the 32 bits of the cyclic prefix thereby being removed.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “a symbol synchronizer in communication with the ADC configured to determine when the data stream contains a cyclic prefix, the signal synchronizer further configured to remove the received signal from the phase locked-loop input when the cyclic prefix is present.” Aslanis merely discloses removing the cyclic prefix by “buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 21, and the rejection of claim 21 should be withdrawn.

#### *Independent Claim 23*

Claim 23 calls for “a symbol synchronizer in communication with the ADC configured to determine when the data stream contains a cyclic prefix, the signal synchronizer further configured to remove the received signal from the phase locked-loop input when the cyclic prefix is present.” For the reasons discussed above for claim 21, which are repeated and re-alleged herein, the Aslanis patent fails to disclose or teach such a symbol synchronizer. For at least this reason, the rejection of claim 23 should be withdrawn.

#### *Independent Claim 25*

Independent claim 25 is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “a discrete Fourier transform (DFT) in communication with the equalizer, the DFT configured to convert the time-equalized received signal and to generate a pilot tone phase error estimate signal” or “a symbol synchronizer in communication with the ADC configured to remove the cyclic prefix from the signal sample stream.”

In regards to the DFT, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 38 of Fig. 1 and col. 5, lines 27-31, which specifically states:

These 512 time domain samples are supplied to the 512-point FFT unit 38 and are transferred by this unit to a frequency domain multicarrier symbol, comprising 256 complex tone amplitudes, which is supplied to the frequency domain equalizer (FEQ) in the unit 40.

In regards to the symbol synchronizer, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 36 in Fig. 1 and col. 5, lines 23-27, which specifically states:

The equalized serial time domain sample stream is supplied to the buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol, the 32 bits of the cyclic prefix thereby being removed.

As can be verified from a review of these cited portions of Aslanis, there is no teaching or disclosure of “a discrete Fourier transform (DFT) in communication with the equalizer, the DFT configured to convert the time-equalized received signal and to generate a pilot tone phase error estimate signal” or “a symbol synchronizer in communication with the ADC configured to remove the cyclic prefix from the signal sample stream.” Aslanis merely discloses a 512-point FFT that transfers the 512 time domain samples to a frequency domain multicarrier symbol, comprising 256 complex tone amplitudes and a “buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol.” Accordingly, the rejection is deficient in these areas. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 25, and the rejection of claim 25 should be withdrawn.

#### *Independent Claim 27*

Independent claim 27, as amended, is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “means for detecting a phase error between the received pilot tone and a local oscillator signal.”

First, Applicant notes that the above element is set forth in means plus function format. Pursuant to 35 U.S.C. § 112(6), a claim element recited in means-plus-function format “shall

be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” 35 U.S.C. § 112, ¶ 6. The Federal Circuit has clearly endorsed this statutory mandate by holding that claims interpreted under 35 U.S.C. § 112, paragraph 6, are limited to the corresponding structure disclosed in the specification and its equivalents. Kahn v. General Motors Corp. 135 F.3d 1472, 45 U.S.P.Q.2d 1608 (Fed. Cir. 1998).

There should be no question but that the above element in claim 27 is to be construed pursuant to 35 U.S.C. § 112, paragraph 6. In Greenberg v. Ethicon Endo-Surgical Inc., 91 F.3d 1580, 39 U.S.P.Q. 2d 1783 (Fed. Cir. 1996), the Federal Circuit stated that the use of “means for” language generally invokes 112(6). Indeed, only if means plus function claim elements recite sufficient structure to carry out the function are they taken out of the ambit of 35 U.S.C. § 112, paragraph 6. Cole v. Kimberly-Clark Corp., 102 F.3d 524, 41 U.S.P.Q.2d 1001 (Fed. Cir. 1996).

Indeed, the Federal Circuit reiterated in Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420, 44 U.S.P.Q.2d 1103 (Fed. Cir. 1998) that “the use of the word ‘means,’ which is part of the classic template for functional claim elements, gives rise to ‘a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses.” Ultimately, the Court in Sage construed the relevant claim elements under 35 U.S.C. § 112(6), because ‘means’ were recited, and the claim elements did not “explicitly recite[s] the structure, material, or acts needed to perform the [recited] functions. Sage at p. 1428. The Federal Circuit further acknowledged this presumption in Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999).

Thus, claim elements expressed in “means” plus function format are construed as determined in accordance with 35 U.S.C. § 112, paragraph 6, as set forth above, and as further described in In re Donaldson 16 F.3d 1189, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994)(*en banc*). Therefore, the various “means” elements must be construed in accordance with the structure set forth in the present specification. In this regard, Applicant notes that, in In re Donaldson, The Board of Patent Appeals and Interferences advanced the legal proposition that “limitations appearing in the specification are *not* to be read into the claims of an application.” In re Donaldson at 1848. This argument, however, was rejected by the Federal Circuit, which held, as a matter of



law, that “one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure ... described therein, and equivalents thereof. *In re Donaldson* at 1848. Furthermore, the holding in *In re Donaldson* does not conflict with the principle that claims are to be given their broadest reasonable interpretation during prosecution. *In re Donaldson* at 1850.

The corresponding structure disclosed in the present specification that corresponds to the various means elements is distinct from that disclosed in the cited patents. For at least this additional reason, Applicant submits that the rejection of claim 27 should be withdrawn.

In addition to the foregoing reasons, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 50 in Fig. 1 and col. 6, lines 19-27, which specifically states:

The FEQ and decoder unit 36 [40] supplies the phase information of the received pilot tone via a line 54 to the phase comparator 50, and a stored reference phase is also supplied to the phase comparator 50 from a storage 56. The phase comparator 50 produces at its output a digital phase error control signal which is filtered by digital and analog filters in the unit 52 to produce an analog control voltage; this is used to control the VCXO 46 to maintain frequency synchronization.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “means for detecting a phase error between the received pilot tone and a local oscillator signal.” Aslanis merely discloses detecting a phase error between “the phase information of the received pilot tone” and “a stored reference phase.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 27, and the rejection of claim 27 should be withdrawn.

#### *Independent Claim 28*

Independent claim 28, as amended, is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “means for estimating the phase error in the pilot tone with a discrete Fourier transform (DFT).”

First, Applicant notes that the above element is set forth in means plus function format. Pursuant to 35 U.S.C. § 112(6), a claim element recited in means-plus-function format “shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” 35 U.S.C. § 112, ¶ 6. The Federal Circuit has clearly endorsed this statutory mandate by holding that claims interpreted under 35 U.S.C. § 112, paragraph 6, are limited to the corresponding structure disclosed in the specification and its equivalents. Kahn v. General Motors Corp. 135 F.3d 1472, 45 U.S.P.Q.2d 1608 (Fed. Cir. 1998).

There should be no question but that the above element in claim 28 is to be construed pursuant to 35 U.S.C. § 112, paragraph 6. In Greenberg v. Ethicon Endo-Surgical Inc., 91 F.3d 1580, 39 U.S.P.Q. 2d 1783 (Fed. Cir. 1996), the Federal Circuit stated that the use of “means for” language generally invokes 112(6). Indeed, only if means plus function claim elements recite sufficient structure to carry out the function are they taken out of the ambit of 35 U.S.C. § 112, paragraph 6. Cole v. Kimberly-Clark Corp., 102 F.3d 524, 41 U.S.P.Q.2d 1001 (Fed. Cir. 1996).

Indeed, the Federal Circuit reiterated in Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420, 44 U.S.P.Q.2d 1103 (Fed. Cir. 1998) that “the use of the word ‘means,’ which is part of the classic template for functional claim elements, gives rise to ‘a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses.” Ultimately, the Court in Sage construed the relevant claim elements under 35 U.S.C. § 112(6), because ‘means’ were recited, and the claim elements did not “explicitly recite[s] the structure, material, or acts needed to perform the [recited] functions. Sage at p. 1428. The Federal Circuit further acknowledged this presumption in Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999).

Thus, claim elements expressed in “means” plus function format are construed as determined in accordance with 35 U.S.C. § 112, paragraph 6, as set forth above, and as further described in In re Donaldson 16 F.3d 1189, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994)(*en banc*). Therefore, the various “means” elements must be construed in accordance with the structure set forth in the present specification. In this regard, Applicant notes that, in In re Donaldson, The Board of Patent Appeals and Interferences advanced the legal proposition that “limitations

appearing in the specification are *not* to be read into the claims of an application.” *In re Donaldson* at 1848. This argument, however, was rejected by the Federal Circuit, which held, as a matter of law, that “one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure ... described therein, and equivalents thereof. *In re Donaldson* at 1848. Furthermore, the holding in *In re Donaldson* does not conflict with the principle that claims are to be given their broadest reasonable interpretation during prosecution. *In re Donaldson* at 1850.

The corresponding structure disclosed in the present specification that corresponds to the various means elements is distinct from that disclosed in the cited patents. For at least this additional reason, Applicant submits that the rejection of claim 28 should be withdrawn.

In addition to the foregoing reasons, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 38 of Fig. 1 and col. 5, lines 27-31, which specifically states:

These 512 time domain samples are supplied to the 512-point FFT unit 38 and are transferred by this unit to a frequency domain multicarrier symbol, comprising 256 complex tone amplitudes, which is supplied to the frequency domain equalizer (FEQ) in the unit 40.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “means for estimating the phase error in the pilot tone with a discrete Fourier transform (DFT).” Aslanis merely discloses that “[t]hese 512 time domain samples are supplied to the 512-point FFT unit 38 and are transferred by this unit to a frequency domain multicarrier symbol, comprising 256 complex tone amplitudes.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 28, and the rejection of claim 28 should be withdrawn.

### *Independent Claim 29*

Independent claim 29, as amended, is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “means for zeroing out the equalized digital signal from the input to a phase locked-loop while the cyclic prefix is present in the received signal to create a frequency correction signal.”

First, Applicant notes that the above element is set forth in means plus function format. Pursuant to 35 U.S.C. § 112(6), a claim element recited in means-plus-function format “shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” 35 U.S.C. § 112, ¶ 6. The Federal Circuit has clearly endorsed this statutory mandate by holding that claims interpreted under 35 U.S.C. § 112, paragraph 6, are limited to the corresponding structure disclosed in the specification and its equivalents. Kahn v. General Motors Corp. 135 F.3d 1472, 45 U.S.P.Q.2d 1608 (Fed. Cir. 1998).

There should be no question but that the above element in claim 29 is to be construed pursuant to 35 U.S.C. § 112, paragraph 6. In Greenberg v. Ethicon Endo-Surgical Inc., 91 F.3d 1580, 39 U.S.P.Q. 2d 1783 (Fed. Cir. 1996), the Federal Circuit stated that the use of “means for” language generally invokes 112(6). Indeed, only if means plus function claim elements recite sufficient structure to carry out the function are they taken out of the ambit of 35 U.S.C. § 112, paragraph 6. Cole v. Kimberly-Clark Corp., 102 F.3d 524, 41 U.S.P.Q.2d 1001 (Fed. Cir. 1996).

Indeed, the Federal Circuit reiterated in Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420, 44 U.S.P.Q.2d 1103 (Fed. Cir. 1998) that “the use of the word ‘means,’ which is part of the classic template for functional claim elements, gives rise to ‘a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses.” Ultimately, the Court in Sage construed the relevant claim elements under 35 U.S.C. § 112(6), because ‘means’ were recited, and the claim elements did not “explicitly recite[s] the structure, material, or acts needed to perform the [recited] functions. Sage at p. 1428. The Federal Circuit further acknowledged this presumption in Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999).

Thus, claim elements expressed in “means” plus function format are construed is determined in accordance with 35 U.S.C. § 112, paragraph 6, as set forth above, and as further described in In re Donaldson 16 F.3d 1189, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994)(*en banc*). Therefore, the various “means” elements must be construed in accordance with the structure set forth in the present specification. In this regard, Applicant notes that, in In re Donaldson, The Board of Patent Appeals and Interferences advanced the legal proposition that “limitations appearing in the specification are *not* to be read into the claims of an application.” In re Donaldson at 1848. This argument, however, was rejected by the Federal Circuit, which held, as a matter of law, that “one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure ... described therein, and equivalents thereof. In re Donaldson at 1848. Furthermore, the holding in In re Donaldson does not conflict with the principle that claims are to be given their broadest reasonable interpretation during prosecution. In re Donaldson at 1850.

The corresponding structure disclosed in the present specification that corresponds to the various means elements is distinct from that disclosed in the cited patents. For at least this additional reason, Applicant submits that the rejection of claim 29 should be withdrawn.

In addition to the foregoing reasons, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 36 in Fig. 1 and col. 5, lines 23-27, which specifically states:

The equalized serial time domain sample stream is supplied to the buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol, the 32 bits of the cyclic prefix thereby being removed.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “means for zeroing out the equalized digital signal from the input to a phase locked-loop while the cyclic prefix is present in the received signal stream to create a frequency correction signal.” Aslanis merely discloses removing the cyclic prefix by “buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 29, and the rejection of claim 29 should be withdrawn.

### *Independent Claim 30*

Independent claim 30, as amended, is allowable for at least the reason that Aslanis does not disclose, teach, or suggest “means zeroing out the far-end signal when the cyclic prefix is present from the input to a phase locked-loop.”

First, Applicant notes that the above element is set forth in means plus function format. Pursuant to 35 U.S.C. § 112(6), a claim element recited in means-plus-function format “shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” 35 U.S.C. § 112, ¶ 6. The Federal Circuit has clearly endorsed this statutory mandate by holding that claims interpreted under 35 U.S.C. § 112, paragraph 6, are limited to the corresponding structure disclosed in the specification and its equivalents. Kahn v. General Motors Corp. 135 F.3d 1472, 45 U.S.P.Q.2d 1608 (Fed. Cir. 1998).

There should be no question but that the above element in claim 30 is to be construed pursuant to 35 U.S.C. § 112, paragraph 6. In Greenberg v. Ethicon Endo-Surgical Inc., 91 F.3d 1580, 39 U.S.P.Q. 2d 1783 (Fed. Cir. 1996), the Federal Circuit stated that the use of “means for” language generally invokes 112(6). Indeed, only if means plus function claim elements recite sufficient structure to carry out the function are they taken out of the ambit of 35 U.S.C. § 112, paragraph 6. Cole v. Kimberly-Clark Corp., 102 F.3d 524, 41 U.S.P.Q.2d 1001 (Fed. Cir. 1996).

Indeed, the Federal Circuit reiterated in Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420, 44 U.S.P.Q.2d 1103 (Fed. Cir. 1998) that “the use of the word ‘means,’ which is part of the classic template for functional claim elements, gives rise to ‘a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses.” Ultimately, the Court in Sage construed the relevant claim elements under 35 U.S.C. § 112(6), because ‘means’ were recited, and the claim elements did not “explicitly recite[s] the structure, material, or acts needed to perform the [recited] functions. Sage at p. 1428. The Federal Circuit further acknowledged this presumption in Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999).

Thus, claim elements expressed in “means” plus function format are construed is determined in accordance with 35 U.S.C. § 112, paragraph 6, as set forth above, and as further described in In re Donaldson 16 F.3d 1189, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994)(*en banc*). Therefore, the various “means” elements must be construed in accordance with the structure set forth in the present specification. In this regard, Applicant notes that, in In re Donaldson, The Board of Patent Appeals and Interferences advanced the legal proposition that “limitations appearing in the specification are *not* to be read into the claims of an application.” In re Donaldson at 1848. This argument, however, was rejected by the Federal Circuit, which held, as a matter of law, that “one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure ... described therein, and equivalents thereof. In re Donaldson at 1848. Furthermore, the holding in In re Donaldson does not conflict with the principle that claims are to be given their broadest reasonable interpretation during prosecution. In re Donaldson at 1850.

The corresponding structure disclosed in the present specification that corresponds to the various means elements is distinct from that disclosed in the cited patents. For at least this additional reason, Applicant submits that the rejection of claim 30 should be withdrawn.

In addition to the foregoing reasons, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 36 in Fig. 1 and col. 5, lines 23-27, which specifically states:

The equalized serial time domain sample stream is supplied to the buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol, the 32 bits of the cyclic prefix thereby being removed.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “means for zeroing out the far-end digital signal when the cyclic prefix is present from the input to a phase locked-loop.” Aslanis merely discloses removing the cyclic prefix by “buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 30, and the rejection of claim 30 should be withdrawn.

### Response To Claim Rejections Under 35 U.S.C. §103

Claims 1 and 2 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Jenness (U.S. Patent No. 6,404,774). Applicant respectfully traverses this rejection.

Claims 14-18 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Aslanis et al. (U.S. Patent No. 5,627,863). Applicant respectfully traverses this rejection.

It is well established at law that, for a proper rejection of a claim under 35 U.S.C. §103 as being obvious based upon a single reference, the reference must disclose, teach, or suggest, either implicitly or explicitly, all elements of the claim at issue. *See, e.g., In Re Dow Chemical*, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), and *In re Keller*, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981).

#### *Independent Claim 1*

Independent claim 1 is allowable for at least the reason that Jenness does not disclose, teach, or suggest “generating DMT signal segments REVERB and SEGUE with a pseudo-random pattern generator using an initial pattern that minimizes the pilot tone phase and offsets in both segments.”

In this regard, and with reference to the teachings of the Jenness patent, the Office Action has cited col. 13, lines 24-46-27 and col. 14, lines 23-35, which specifically state:

In interval 312, the Control Processor 114 in the ATU-R transmits a Residence-Voice Band-Reverberation (R-VB-REVERB) signal, which is a defined signal and is shown capitalized, and transmits this signal via the subscriber loop 52 to the Control Processor 14 in the ATU-C. The R-VB-REVERB signal is defined as the extension to the 0-24 KHz spectrum of the normal R-REVERB-3,4,5 tones defined in T1E1.4/98-007R1 (cited hereinbefore). The R-VB-REVERB signal is a wideband pseudo-random signal used for estimation of the upstream Signal-To Noise Ratio (SNR) at the ATU-C. More particularly, this signal is defined herein as an arbitrary pseudo-random 12-bit sequence, 101000010010 applied in pairs as  $d_n$ ,  $d_{n+1}$  coefficients to the DC, Nyquist, and succeeding tone bins through  $d_{10}$ ,  $d_{11}$  applied to tone #5. The amplitude of each carrier is set to produce a spectral density of -38 dBm. Tones above the low spectrum carry user data during this interval. Note that any other pseudo-random sequence transmitted at known amplitude would work similarly. The Central Office Control Processor 14 performs a Voice Band-Analysis (C-VB-Analysis) which analyzes the voice band channel (0-24 KHz).



The analysis process produces a measurement of the signal amplitude and channel noise for each tone channel, which is then used by the Control Processor 14 to compute, for each tone channel, the optimum transmission amplitude.

In interval 316, each of the ATU-C and ATU-R transmit a defined Segue signal (VB-SEGUE?) which is a broadband signal across the low tones #1-#5 that are going to be used. The Segue signal is the signal that causes a change from performing the Voiceband Initialization sequence to a "Showtime" state. The "Showtime" state is the operating state of a pair of ADSL modems (ATU-C and ATU-R), and is defined in the T1.413 and ITU standard cited hereinbefore. The Voiceband Initialization sequence provides a definition of a mandatory "pulse" on the ATU-C indicator bit #18 at the beginning of the Showtime state, and allows the ATU-R to know the state of the current POTS service.

As can be verified from a review of these cited portions of Jenness, there is no teaching or disclosure of "generating DMT signal segments REVERB and SEGUE with a pseudo-random pattern generator using an initial pattern that minimizes the pilot tone phase and offsets in both segments." Jenness merely discloses signal segments REVERB and SEGUE, but does not disclose generating them with "a pseudo-random pattern generator using an initial pattern that minimizes the pilot tone phase and offsets in both segments." Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Jenness patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Jenness patent fails to teach, disclose, or suggest the invention as defined by claim 21, and the rejection of claim 1 should be withdrawn.

#### *Independent Claim 14*

Independent claim 14 is allowable for at least the reason that Aslanis does not disclose, teach, or suggest "[a] digital signal processor configured to compensate for the offset in phase error on a received pilot tone based upon the received signal segment in the discrete multi-tone (DMT) system initialization sequence."

In this regard, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 12 in Fig. 1 and col. 6, lines 13-27, which specifically states:

The receiver 12 includes a voltage controlled crystal oscillator (VCXO) 46 which produces on a line 48 a sampling clock for the ADC in the unit 32, synchronized to the 2.208 MHz sampling frequency of the transmitter 10 by a control loop which includes a phase comparator 50 and digital and analog control

loop filters represented by a unit 52. The FEQ and decoder unit 36 [40] supplies the phase information of the received pilot tone via a line 54 to the phase comparator 50, and a stored reference phase is also supplied to the phase comparator 50 from a storage 56. The phase comparator 50 produces at its output a digital phase error control signal which is filtered by digital and analog filters in the unit 52 to produce an analog control voltage; this is used to control the VCXO 46 to maintain frequency synchronization.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “[a] digital signal processor configured to **compensate for the offset in phase error** on a received pilot tone based upon the received signal segment in the discrete multi-tone (DMT) system initialization sequence.” Aslanis merely discloses producing a digital phase error control signal with the phase comparator. Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach, disclose, or suggest the invention as defined by claim 14, and the rejection of claim 14 should be withdrawn.

#### *Independent Claim 16*

Independent claim 16 is allowable, as amended, for at least the reason that Aslanis does not disclose, teach, or suggest “[a] digital signal processor configured to detect and zero out the cyclic prefix from a received digital signal stream at an input to a phase locked-loop when the cyclic prefix is present.”

In this regard, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 12 in Fig. 1 and col. 5, lines 19-27, which specifically states:

The TEQ 34 is a finite impulse response filter which serves to limit most of the impulse response to less than the duration of the cyclic prefix, so that subsequent removal of the cyclic prefix reduces the interference between consecutive multicarrier symbols. The equalized serial time domain sample stream is supplied to the buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol, the 32 bits of the cyclic prefix thereby being removed.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of “[a] digital signal processor configured to detect and zero out the cyclic prefix from a received digital signal stream at an input to a phase locked loop when the cyclic prefix is

present.” Aslanis merely discloses removing the cyclic prefix by “buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol.” Accordingly, the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 16, and the rejection of claim 16 should be withdrawn.

#### *Independent Claim 18*

Independent claim 18 as amended, for at least the reason that Aslanis does not disclose, teach, or suggest a “digital signal processor further configured ... to perform a discrete Fourier transform on the digital signal stream when the cyclic prefix is not present to create a phase error signal for application at the input to a phase locked-loop.”

In this regard, and with reference to the teachings of the Aslanis patent, the Office Action has cited block 12 in Fig. 1 and col. 5, lines 15-31, which specifically states:

In the receiver 12, the signal received via the transmission path 18 is supplied by the hybrid circuit 16 to the filter and ADC unit 32, to reproduce the 544 serial samples per multicarrier symbol which are supplied to the time domain equalizer (TEQ) 34. The TEQ 34 is a finite impulse response filter which serves to limit most of the impulse response to less than the duration of the cyclic prefix, so that subsequent removal of the cyclic prefix reduces the interference between consecutive multicarrier symbols. The equalized serial time domain sample stream is supplied to the buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol, the 32 bits of the cyclic prefix thereby being removed. These 512 time domain samples are supplied to the 512-point FFT unit 38 and are transformed by this unit to a frequency domain multicarrier symbol, comprising 256 complex tone amplitudes, which is supplied to the frequency domain equalizer (FEQ) in the unit 40.

As can be verified from a review of this cited portion of Aslanis, there is no teaching or disclosure of a “digital signal processor further configured ... to perform a discrete Fourier transform on the digital signal stream when the cyclic prefix is not present to create a phase error signal for application at the input to a phase locked-loop.” Aslanis merely discloses removing the cyclic prefix by “buffer 36, which produces at its parallel output the 512 time domain samples of each multicarrier symbol,” which “are transferred by this unit [FFT unit 38] to a frequency domain multicarrier symbol, comprising 256 complex tone amplitudes.” Accordingly,

the rejection is deficient in this area. Notwithstanding, the undersigned has reviewed the entirety of the Aslanis patent and has failed to identify any such teaching anywhere within this reference. Accordingly, the Aslanis patent fails to teach or disclose the invention as defined by claim 18, and the rejection of claim 18 should be withdrawn.

Dependent Claims:

Dependent claims 2, 4-6, 8, 10, 12, 15, 17, 20, 22, 24, and 26 are believed to be allowable for at least the reason that these claims depend from allowable independent claims 1, 3, 7, 9, 11, 14, 16, 19, 21, 23, and 25, respectively. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988).

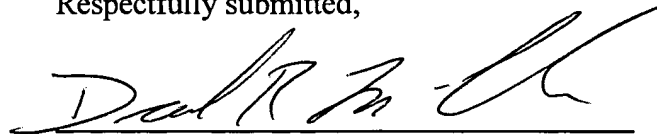
Prior Art Made of Record

The prior art made of record has been considered, but is not believed to affect the patentability of the presently pending claims.

**CONCLUSION**

In light of the foregoing amendments and for at least the reasons set forth above, Applicant respectfully submits that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the now pending claims 1-30 are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned agent at (770) 933-9500.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Daniel R. McClure', written over a horizontal line.

**Daniel R. McClure, Reg. No. 38,962**

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